BOTANY OF THE 1841 FRÉMONT–GEYER EXPEDITION TO THE DES MOINES RIVER[1]

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ABSTRACT

In June and July 1841, Lt. John Charles Frémont of the United States Army Corps of Topographical Engineers led a survey of the lower Des Moines River in the territory of Iowa and the state of Missouri, accompanied by botanist Karl Andreas Geyer. The resulting publication was the earliest to report on the flora of Iowa in any sort of scientific fashion. Frémont described the major plant communities encountered, in the process mentioning 30 species: 24 trees and shrubs of the forest and six herbs of the prairie. Seven herbaceous species not mentioned in the report are documented by specimens in the herbarium of Missouri Botanical Garden.

Key words: Botanical exploration, botanical history, Des Moines River, George Engelmann, Iowa, John Charles Frémont, Joseph Nicolas Nicollet, Karl Andreas Geyer, Missouri.

John Charles Frémont (1813–1890) looms large in American history (Warren, 1859; Wilson & Fiske, 1888; Dellenbaugh, 1914; Nevins, 1928; Phillips, 1935; Egan, 1977; Chaffin, 2002): exploring and mapping the Rocky Mountains, the Oregon Country, the Great Basin, and the Sierra Nevada; helping to wrest California from Mexico and shepherding it to statehood; convicted on charges of mutiny, disobedience of a superior officer, and military misconduct; standing as the Republican Party's first candidate for President; emancipating Missouri's slaves while serving as commanding general of the Army's Department of the West. Among botanists, he is known as the eponym or author of numerous names bestowed on plants discovered during his explorations: *Fremontodendron* Coville, *Oxystylis* Torr. & Frém., *Amsonia tomentosa* Torr. & Frém., *Gentiana fremontii* Torr., *Pinus monophylla* Torr. & Frém., *Populus fremontii* S. Watson, *Prunus fremontii* S. Watson, and *Senecio fremontii* Torr. & A. Gray, to name but a few.

Posterity has decreed that Frémont's 1842 exploration of the Rocky Mountains was his first expedition (Ewan, 1950; Jackson & Spence, 1970; Schubert, 1980; Welsh, 1998), and the explorer himself considered it such (Frémont 1887: 73). It and his four subsequent expeditions were written up in great detail (Frémont, 1843, 1845a, 1845b, 1846, 1848, 1853) and publicized widely (Benton, 1850; Torrey, 1853; Bigelow, 1856; Smucker, 1856; Upham, 1856; Warren, 1859). However, the summer before this supposedly first expedition, he led an expedition to the lower Des Moines River in the territory of Iowa and state of Missouri. This earlier expedition generated but a single brief report buried among Congressional debate of the Iowa–Missouri border dispute (Anonymous, 1842), and Frémont's biographers seem to mention it only because of the role it played in his courtship and marriage (see below). Iowa's historians likewise have accorded it scant attention compared to similar military reconnaissances of the state (Lea, 1836, 1890; Allen, 1846; van der Zee, 1913; Pelzer, 1917; Hurt, 1998).

In all his expeditions, Frémont paid special attention to the plant life of the areas surveyed, and this was just as true for the Des Moines River expedition. As a result, his published report (Frémont, 1842) was the first to describe the flora of Iowa in any sort of scientific fashion. However, like Rauch's (1851) first checklist of the state flora (Lammers, 2013), Frémont's report has not been mentioned in the Iowa floristic literature (e.g., Bessey, 1871; Fitzpatrick, 1899; Gilly, 1947; Thorne, 1954; Eilers, 1975; Eilers & Roosa, 1994; Lewis, 1998; but cf. Yatskievych, 1999). It is all but unknown to the state's botanists, although Iowa's historians learned of it almost a century ago (van der Zee, 1916; Shambaugh, 1918). The objective of this

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paper is to collate all available information on the expedition to the Des Moines River, as an avowed supplement to Welsh's (1998) comprehensive account of the botany of Frémont's five subsequent expeditions, in order to assure for it the place it deserves in Iowa's botanical history and in the Great Pathfinder's legacy.

Prior Surveys by Frémont

To give context to Frémont's survey of the Des Moines River, a brief overview of his prior work in this line is provided. This has been synthesized from his autobiography (Frémont, 1887) and various biographical sources (Benton, 1850; Bigelow, 1856; Smucker, 1856; Upham, 1856; Wilson & Fiske, 1888; Dellenbaugh, 1914; Nevins, 1928; Egan, 1977; Welsh, 1998; Chaffin, 2002). These primary sources, which should be consulted for additional information, are not cited further in this section.

In 1833, former Congressman Joel Roberts Poinsett (1779–1851) of Charleston, South Carolina, assisted a young man of his acquaintance, John Charles Frémont, in securing an assignment as an instructor of mathematics aboard the 200-ton sloop-of-war U.S.S. *Natchez*. When that assignment ended, Poinsett helped Frémont obtain a position as an assistant to Capt. William G. Williams (1801–1846) of the United States Army Corps of Engineers. Williams was then engaged in surveying a route through mountain passes on the North Carolina–Tennessee border for the proposed Louisville, Cincinnati & Charleston Railroad. When work on the line was suspended, Williams hired Frémont to assist him on his next assignment, a military reconnaissance of Cherokee lands in Georgia and adjacent states. Frémont later wrote that it was during this period, while working with Williams, that he found the path in life that he was "destined to walk" (Frémont, 1887: 24).

In 1837, Frémont's benefactor Poinsett was appointed Secretary of War in the Cabinet of President Martin Van Buren (1782–1862). With a letter of recommendation from Capt. Williams, Frémont wrote to Poinsett, seeking a commission in the Army as a topographical engineer. When the Cherokee project concluded, Frémont was ordered to Washington. The Department of War had contracted with French cartographer Jean (Joseph) Nicolas Nicollet (1786–1843) to prepare a detailed map of the upper Mississippi River valley, and Frémont was to be his assistant.

However, when the young surveyor left Washington on that assignment in April 1838, it was as a civilian employee, under the provisions of the act of 30 April 1824 (*4 Stat., 46*). His commission as a second lieutenant in the United States Army did not come about until passage of the act of 5 July 1838 (*5 Stat., 162*), which established the Corps of Topographical Engineers as an entity distinct from the Corps of Engineers and authorized staffing its ranks with its former contractors (Beers, 1942; Schubert, 1980). Frémont spent the 1838 and 1839 field seasons assisting Nicollet in what is today Wisconsin, Minnesota, and the eastern Dakotas (Bray, 1970, 1980; Bray & Bray, 1976).

In addition to Nicollet and Frémont, the survey party included Karl (Charles) Andreas Geyer (1809–1853), a German botanist who had emigrated from Saxony to New York in 1834 (Torrey, 1843, 1845; Geyer, 1845; Reichenbach, 1855; Spaulding, 1909; Nute, 1945; McKelvey, 1955; Heinz, 1989). In 1835, Geyer had botanized on the Big Nemaha River and the North Fork of the Platte River in what is today Nebraska. Returning to St. Louis via steamboat, he met Nicollet. Nicollet was so impressed by the young German that when he was assigned to map the upper Mississippi watershed, he offered to pay Geyer out of his own pocket to document the flora of the region. Geyer declined the offer in 1836–1837, but did take part in the 1838–1839 expeditions. That first autumn, during a visit to Spirit Lake in what is now Dickinson Co., Iowa, Geyer collected some of the earliest herbarium specimens known from the state (Shimek, 1915; Eilers, 1975; Bray & Bray, 1976; Lammers, 1985, 2013); these were identified and described by Torrey (1843, 1845).

Nicollet and Frémont returned to Washington in December 1839 to begin work on the map (Nicollet, 1843a) and the accompanying report (Nicollet, 1843b, 1845) at the Bureau of the Corps of Topographical Engineers. Proponents of westward expansion were much interested in the map, and frequently called at the Bureau to view its progress. Among the many men of influence whom Frémont met in this way was Sen. Thomas Hart Benton (1782–1858) of Missouri. Like Poinsett before him, the senator would become a major figure in the development of the young topographer's career. And when Frémont later met the senator's 15-year-old daughter, Jessie Ann Benton (1824–1902), it was love at first sight. Her parents, while holding the young lieutenant in high personal regard, were opposed to his suit, in part because of Jessie's youth and in part because of the vagaries of a military career; they insisted upon a one-year moratorium of the courtship.

On 4 June 1841, Frémont received orders from his superior at the Bureau, Col. John James Abert (1788–

1863), to "repair without delay to the mouth of the Racoon [sic] fork of the Des Moines, in order to determine that position, and the Topography of the adjacent country," and to make a survey of the Des Moines from there to its mouth (Jackson & Spence, 1970: 96). To Frémont, this assignment represented advancement, as it was his first opportunity to direct a survey himself instead of merely assisting another topographer (Frémont, 1887).

Rationale for the Des Moines River Survey

More has been written on the rationale behind the Des Moines River survey than on the events of the survey itself. Many of Frémont's biographers indicate that issuance of the order was occasioned by his courtship of Miss Benton, that it was simply a ploy to take an unsuitable suitor out of the picture. Frémont (1887: 68) himself believed this to be the case, writing, "Whether or not this detachment of myself from Washington originated with Mr. Nicollet I do not know, but I was loath to go ... the survey was a health-giving excursion, but it did not cure the special complaint [i.e., his fondness for Miss Benton] for which I had been sent there."

Some suggest that Sen. Benton himself used his political influence to arrange Frémont's dispatch (Wilson & Fiske, 1888; McKelvey, 1955). Others point to his wife, Elizabeth McDowell Benton (1794–1854), and her close friendship with Mary Izard Pringle Poinsett (1780–1857), the wife of Joel Roberts Poinsett (see above), as the origin of the ruse (Nevins, 1928; Phillips, 1935). However, Poinsett's tenure as Secretary of War ended on 5 March 1841 with the inauguration of President William Henry Harrison (1773–1841), and it was not until this time that the Bentons truly became alarmed at the depth of their daughter's feelings for the young lieutenant (Dellenbaugh, 1914; Egan, 1977). By the time Frémont was ordered to Iowa Territory three months later, Poinsett had been replaced as Secretary of War by John Bell (1796–1869). However much Poinsett may have sympathized with the Bentons, it would seem that he was not in a position to effect such an order.

On the other hand, Jackson and Spence (1970) were skeptical of the idea that Frémont's affection for Jessie was the raison d'être for the Des Moines River survey. Instead, they pointed to the ongoing border dispute between the territory of Iowa and the state of Missouri, which hinged on understanding the hydrologic feature long known as the Rapids of the Des Moines (Anonymous, 1842; Edwards, 1843; Avery, 1894; Larzelere, 1916): was it situated in the Des Moines River itself, or in the Mississippi River near the mouth of the Des Moines? Jackson and Spence (1970) suggest that Benton counted on Frémont's survey to support the former position and thus ensure a placement of the boundary more favorable to Missouri.

However, nothing in Frémont's orders or in his report dated 19 April 1842 speaks to the border dispute. His comments on rapids on the Des Moines River appear only in an addendum written on 10 December 1842, a year and a half after the survey, in response to a direct query from Rep. John Cummins Edwards (1804–1888) of Missouri. Here he described his examination of them as "merely incidental" (Frémont, 1842: 19). Nevertheless, Edwards (1843) utilized carefully edited snippets of Frémont's report in a speech favoring a more northerly boundary. Congress was unable to resolve the issue, and it was not until 1849 that the current border was established by the United States Supreme Court (*State of Missouri v. State of Iowa, 48 U.S. 660*).

One aspect of the survey I have not seen discussed: whether there actually was a need for the data gathered by Frémont. If indeed there was, then there was nothing about the order that was "mysterious" (Bigelow, 1856: 34). Nicollet himself was at that time too ill to travel (Nicollet, 1843b, 1845; Bray, 1970, 1980; Bray & Bray, 1976) and as his assistant, Frémont was the logical choice to go in his stead. But if the data weren't actually needed for Nicollet's (1843a) map, then indeed one might ask why he was sent. Was the lower Des Moines River valley actually an unexplored lacuna? The facts suggest largely that it was not.

On 7 June 1835, Companies B, H, and I of the United States Regiment of Dragoons under the command of Lt. Col. Stephen Watts Kearny (1794–1848) departed Fort Des Moines, then situated on the Mississippi River at what is today Montrose in Lee Co., Iowa (Lea, 1836; van der Zee, 1914; Pelzer, 1917; Gourley, 2009). For the next 12 weeks, the dragoons explored much of what is today Iowa and southern Minnesota. Of particular interest here is the fact that Lt. Albert Miller Lea (1804–1891) descended the Des Moines River in a canoe, just as Frémont would do six years later. Like Frémont, he created a detailed map as he went (Lea, 1890; Pelzer, 1917). Lea's map and all accompanying notes and sketches were made available to Nicollet; Lea even met Nicollet in Washington in 1841 while serving as Chief Clerk of the War Department (Lea, 1890). Clearly, Jackson and Spence (1970: 96) erred when they stated that there "was no continuous and extensive survey of the entire river below the forks" prior to Frémont's 1841 survey.

Furthermore, the area of the Raccoon Forks already had been surveyed. In the summer of 1838, Capt. Nathan Boone (1781–1856) of the Dragoons and Capt. Augustus Canfield (1801–1854) of the Topographical Engineers charted the area carefully while laying out the course of a military road between Fort Leavenworth on the Missouri River and Fort Snelling at the mouth of the Minnesota River (Lees, 1914; Hurt, 1998).

Finally, another member of the Corps of Topographical Engineers, Capt. Walter Burling Guion (1808–1845), had just visited the same stretch of the Des Moines. His orders were issued by Col. Abert on 1 December 1840, six months before Frémont's orders, and the work was performed "so soon as favorable weather in the spring [of 1841] ... permitted" (Guion, 1842: 13). The resulting report (Guion, 1842), dealing with the bed of the river and impediments it presented to navigation, was dated 9 October 1841.

With the completion of these three surveys, the lower Des Moines River and the Raccoon Forks had already been surveyed as extensively as many other locations on Nicollet's (1843a) map. In light of this, the rationale for Abert's order to Frémont indeed is unclear.

Personnel and Preparations

The primary structure of the following two sections is a synthesis of Frémont's (1842) published report with official government documents unearthed in various archives and published verbatim by Jackson and Spence (1970). Consequently, those two sources are not cited again in this section, other than to substantiate direct quotes. This basic narrative is then fleshed out with facts from diverse secondary sources, which are cited. Assumptions, interpretations, and extrapolations originating with me are stated in first person for clarity.

Frémont arrived in St. Louis, Missouri, no later than Monday, 21 June 1841. He took lodging at B. W. Ayres' Green Tree Tavern at 68 Second St., and spent the next four days purchasing equipment and supplies. For example, at the hardware store of Adolphus Meier & Co. at 23 Main St., he bought cooking equipment, axes, and a tin lantern; from grocers Angelrodt, Eggers & Barth at 165 Main St., numerous expendables, including a half barrel of crackers, 50 lb. of rice, 25 lb. of coffee, 4 lb. each of tea and chocolate, 6 lb. of candles, 2 1/2 lb. of soap, and 34 lb. of chewing tobacco (the last presumably intended for barter with the Sauk and Meskwaki); and from optician Jacob Blattner, 34 Olive St., a $50 Bavarian-made spyglass. Frémont also bought a gray horse for $75, and fitted it out with a Spanish saddle, bridle, martingale, and three side hobbles.

While in St. Louis, Frémont sought out Pierre Chouteau, Jr. (1789–1865), whom he had met during the Nicollet expeditions. Chouteau was the proprietor of the trading house that once had been the Western Department of the American Fur Co. (Chittenden, 1902), a powerful and influential man throughout the West. As he had done for Nicollet, Chouteau provided Frémont with letters of introduction, directing his firm's representatives on the Des Moines River to assist the topographer in carrying out his survey.

Frémont also sought out another familiar face from the Nicollet expeditions: Karl Geyer. Though Geyer's name appears nowhere in Frémont's (1842) report, he later stated (Frémont, 1887: 68) that during the Des Moines River expedition, "Mr. Geyer did all that the season and time allowed for botany." Geyer was hired at the rate of $1.50 per diem, not as a botanist but as a boat hand (engagé), a subterfuge I suspect was necessitated by the War Department's lack of interest in botanical studies. Seeking to supplement this paltry salary, Frémont wrote to Nicollet on the botanist's behalf on 23 June (see below). Through Geyer, Frémont met Dr. George Engelmann (1809–1884), a local physician. Engelmann had botanized around St. Louis with Geyer the previous year (Reichenbach, 1855; McKelvey, 1955), and soon would become the foremost botanist of his day to reside in the West (White, 1896; Spaulding, 1909; Shaw, 1986; Wolf, 1988; Long, 1995).

Frémont also hired Clément Lambert (1807–1879), an experienced voyageur, as boat hand and cook. The following year, Lambert participated in Frémont's expedition to the Rocky Mountains (Frémont, 1845a, 1845b, 1846), and a decade after that, he became one of the founding fathers of Decatur, Nebraska (DeMilt, 1902; Sutherland, 1929).

Itinerary

To reach the Des Moines River from St. Louis, Frémont's party took passage on the *Monsoon*, a first-class packet boat that operated for many years on Western waters (Steele, 1841; Mahan, 1921); Capt. William S. Randolph was her master (Anonymous, 1841; Hughes, 1841). For the 1841 season, she steamed upriver from St. Louis to Keokuk in Iowa Territory every Monday and Friday at 4:00 PM, returning to St. Louis the following day at 8 PM. Her advertised ports-of-call (from south to north) were Alton, Illinois; Hannibal and Marion City, Missouri; Quincy and Warsaw, Illinois; and "all intermediate ports" (Anonymous, 1841).

Frémont, Geyer, and Lambert steamed away from St. Louis at 4:00 PM on Friday, 25 June. The young lieutenant took one of the gentlemen's cabins that surrounded the dining room at the center of the middle deck at a cost of $5, while his engagés had to make do with deck passage at $2 each. No mention is made of lading the horse he had purchased, unless it counted as one of the eight packages of merchandise for which he paid 75¢ in freight charges.

The next day (Saturday, 26 June), the trio disembarked at Churchville in Clark Co., Missouri. This tiny settlement (subsequently subsumed into the village of Alexandria; Anonymous, 1887) was directly across the Mississippi River from Warsaw, Illinois, and approximately five miles downstream from Keokuk, Iowa. In 1841, the confluence of the Des Moines River and the Mississippi lay just a few hundred yards above the settlement (cf. Judson, 1838), although today the river's mouth has meandered more than two miles farther north.

The three men left Churchville on Sunday, 27 June. Equipment and supplies were transported by L. B. Mitchell of Churchville in his mule-drawn wagon. He received $34.93 for transportation of the load "from Churchville, Mo., to the trading post of the American Fur Co. [the antecedent of Chouteau & Co.] in the Sac and Fox [Sauk and Meskwaki] Indian country," and an additional $20 for "transportation of two men [i.e., Geyer and Lambert] between same places" (Jackson & Spence, 1970: 110). I assume that Frémont rode the horse he had purchased; at one point, he mentions a ride of about 12 miles.

Departing Churchville, the group followed a northwesterly course between the Des Moines and Fox rivers. The first nine miles lay over the broad open floodplain of the Mississippi. South of St. Francisville, Missouri, they ascended to the uplands and continued along the ridge where today are found the villages of Peaksville and Revere, Missouri. At first, their route along this ridge ran through oaks. But after two miles, the trees gave way to prairie, through which they rode for all the next day (Monday, 28 June). At some point along this northwesterly trek, they left Missouri, and entered the territory of Iowa in Van Buren Co.

These first two days, the party covered more than 40 miles. That evening they reached "a farm house on the verge of the prairie, about two miles and a half from Chinquest [Chequest] creek" (Frémont 1842: 16). I deduce from the following facts that this farmhouse was in extreme southwestern Van Buren Township (Township 69 North, Range 10 West of the Fifth Principal Meridian), in section 31 or 32. Frémont wrote that the next day, they crossed Chequest Creek at a spot four miles above its mouth. However, he never mentioned crossing Indian Creek, a similar tributary that enters the Des Moines from the west farther downstream, which they would have had to cross at some point. From this, I infer that they continued west until Indian Creek was quite inconsequential, near or above its headwaters. A line drawn from this area up to a point on Chequest Creek four miles above its mouth would run due north, and 2 1/2 miles south of the creek puts them in section 31 or 32 of Van Buren Township. Old maps (Judson, 1838; Anonymous, 1878a) indeed show prairie giving way to forest in this area. According to the General Land Office (<www.glorecords.blm.gov/>), the following men held land patents in those sections at that time: Jerome Briggs, Aaron Harlan, Allan Hiatt, and Thomas Groome. Likely it was with one of these pioneer settlers that the survey party passed the night.

On Tuesday, 29 June, the party departed this farmhouse and headed north. Crossing Chequest Creek (see above), they continued on through broken wooded hills until they reached the Des Moines River at the village of Portland, known today as Leando (Savage, 2007). There they forded the river and continued upstream on the left bank. They passed through Iowaville, a then-important village of which no vestige remains (Evans, 1907), and crossed the line established by the treaty of 21 October 1837 (*7 Stat., 540*). Beyond this line, the territory of Iowa was closed to settlement; the only legal residents were government-licensed traders and the indigenous Sauk and Meskwaki.

Frémont and company continued up the left bank of the river, through the extreme northeastern corner of what would become Davis Co., entering the future Wapello Co. at its southeastern corner. That evening, having covered another 28 miles, they reached their initial destination: the trading post owned by Pierre Chouteau, Jr. & Co.

This establishment comprised eight buildings on the left bank of the Des Moines River, 87 miles above its mouth, at what is today the city of Ottumwa (Anonymous, 1878b; Waterman, 1914; Gallaher, 1916). On the opposite bank were the villages of the Sauk chief Keokuk (1767–1848), and the Meskwaki chiefs Wapello (1787–1842) and Appanoose (Carter, 1900; Ewan, 1930; Nagel, 2009). Three miles to the east, the War Department's Bureau of Indian Affairs maintained an agency (Anonymous, 1878b; Waterman, 1914; Nagel, 2009). At the time of Frémont's survey, Lt. John Beach (1812–1874) had recently succeeded his father-in-law, Gen. Joseph Montfort Street (1782–1840), as agent in charge.

The Chouteau & Co. post was supervised by William (Captain Billy) Phelps (1809–1889), a resident partner of the firm, who lived there with his wife Caroline Kelsey Phelps (1812–1861) and their children (Ewan, 1930; Nagel, 2009). Phelps was "a large swarthy man, as brave as a lion" (Hussey, 1900: 347) and "a professed infidel in sentiment" (Davidson, 1893: 37). With his brother Stephen Sumner Phelps (1805–1880), he had been engaged in trade at various places in west-central Illinois and along the Des Moines River since 1828 (Button, 1884; Hussey, 1900; Ewan, 1930). To the Native Americans with whom he dealt, he was Chechepequa (Winking Eye), a sobriquet occasioned by his penchant for practical jokes; Gov. Robert Lucas (1781–1853) once was the victim of a particularly elaborate prank (Anonymous, 1878b; Sabin & Sabin, 1900; Waterman, 1914). In anticipation of the westward relocation of the Sauk and Meskwaki (Anonymous, 1878b; Rogers, 1993), Phelps moved the company's post farther upriver the following year. With permission from John Sanford of Chouteau & Co., the abandoned buildings were occupied from 12 October 1842 to 17 May 1843 by Company I, First Regiment of Dragoons, under the command of Capt. James Allen (1806–1846). This temporary Army post was unofficially dubbed Fort Sanford (Carter, 1900; van der Zee 1913, 1914; Nagel, 2009), and its site is known to this day as Garrison Rock.

On Wednesday, 30 June, the hired rig returned to Churchville, while the survey crew made preparations. From Phelps, Frémont obtained considerable information on the river's suitability for navigation. The trader had brought the Chouteau & Co. steamboat *Pavillion* up the Des Moines on several occasions (Hussey, 1900; Wright & Young, 1915; Ewan, 1930) and so was quite familiar with such matters. Ample notes were also made (presumably by Geyer) on the characteristic trees in the vicinity, both on the bluffs and on the bottoms.

When the survey party resumed their upriver journey on Thursday morning, 1 July, they were provided by Phelps with a guide and other necessities. By that evening, the group had covered about 20 miles, reaching a second trading post at or near what is today the city of Eddyville. Frémont denominated this "the house of Mr. Jameson—another of the [Chouteau &] company's posts" (Frémont 1842: 16), but the identity of this Jameson is problematic. Accounts of the local fur trade (Thompson, 1850; Anonymous, 1878b; Button, 1884; Carter, 1900; Chittenden, 1902; Waterman, 1914; Gallaher, 1916; van der Zee, 1916; Ewan, 1930; Rogers, 1993) make no mention of anyone named Jameson, though they do indicate the presence at that time of three additional trading posts on the Des Moines River in what is now Wapello Co.

The first of these posts was owned by brothers William G. Ewing (?–1854) and George Washington Ewing (1803–1866) of Indiana, and sat three miles downstream from Phelps's post, at the mouth of Sugar Creek. Its manager during 1841–1842 was Mr. Hunt, "a gentleman of far more education, refinement and culture" than the average trader (Anonymous, 1878b: 364), but whose bookkeeping practices proved problematic (Thompson, 1850). The second post was situated approximately 20 miles upstream from Phelps, at the mouth of Muchankinock Creek adjacent to the village of Sauk chief Wishecomaque, and was owned by Jabish P. Eddy, the eponym of Eddyville.

It was the third post, a quarter of a mile downstream from Eddy's, which I interpret as the one reached on Friday evening by the survey party. This "small establishment" (Anonymous, 1878b: 364) represented an addition to the Chouteau & Co. license held by Phelps. Why Frémont (1842: 16) referred to this as "the house of Mr. Jameson" is unknown. In his table of distances (Frémont 1842: 19), he called it "Vessar's Trading House." Phelps at that time did have in his employ a man named Simpson (Captain Suggs) Vasser. This man figured prominently in Phelps's prank on Gov. Lucas (Anonymous, 1878b; Sabin & Sabin, 1900; Waterman, 1914), and an inkling of his character may be inferred from his parenthetical sobriquet (cf. Hooper, 1845).

Friday, 2 July, was spent at this upriver post, making necessary preparations. Four additional engagés were hired from among the Chouteau & Co. employees, making a party of six under Frémont's command. For a man named Cameron and his horse, Frémont was billed $20; A. Netherson cost $24 to hire; and a Sauk named Packesayso, $11. The fourth man was Simpson Vasser (see above), for whose "services as pilot" (Jackson & Spence, 1970: 111) Frémont paid $36. This larger salary for Vasser suggests to me that he was the guide supplied by Phelps the day before at the main post, who led Frémont and company upstream to this second post.

Saturday, 3 July, the survey of the river valley commenced in earnest. Frémont forded the river and ascended the right bank, presumably on horseback. Five were said to be in the canoe, transporting the provisions and instruments. [I assume that the sixth man accompanied Frémont overland. Geyer, as botanist, would have been the obvious candidate for this; if so, perhaps Cameron's horse was hired for his

benefit. Alternatively, Cameron rode his own horse, guiding Frémont, while Geyer went by canoe.]

The canoe's progress against the current was so slow that Frémont was able to join them at night, after examining the neighboring country during the day. Unfortunately, he provided little information on their itinerary during this period, beyond their departure from the upper Chouteau post on Saturday, 3 July, and their arrival at the Raccoon Fork on Friday, 9 July. Our only details in this regard are derived from Geyer's herbarium specimens (see below).

On Sunday, 4 July, specimen labels place them "10 miles above the upper Saki [Sauk] village." [I assume this refers to the village of the Sauk-Hocąk prophet Wabokieshiek (1794–1841), which lay 1 1/4 miles upstream from the upper Chouteau post (Anonymous, 1878b) and about six miles below the mouth of Cedar Creek. This would place them in what is today Mahaska Co., about six miles southwest of the city of Oskaloosa.]

Our next fix on their position is Wednesday, 7 July, when they were at the mouth of English Creek in what is today Marion Co., just north of the village of Harvey. This is only 17 miles upstream from their position on 4 July. [Covering just 17 miles of river in three days suggests that during this period, Frémont ranged rather far afield through the neighboring countryside. His comment (Frémont, 1842: 17) that "the Missouri dividing ridge [i.e., the Chariton River watershed] ... [was] not more than twelve miles distant" suggests that he rode at least that far from the Des Moines, as does his extensive discussion of the prairie uplands bordering Cedar Creek (see below).]

In contrast to this testudinal pace, only two days were required to cover the 66 miles separating English Creek and their destination. Once they reached the mouth of the Raccoon River in what is today the city of Des Moines in Polk Co., Frémont complied with his orders by determining that point's latitude and longitude via astronomical observation.

While at the Raccoon Fork, Geyer had a close brush with a venomous serpent, presumably *Crotalus horridus* Linnaeus (Viperidae). Frémont (1887: 20) related that the botanist "stooped down and grasped the clustered head of a low flowering plant. Under the broad leaves lay coiled a rattlesnake, close to his hand. Geyer escaped, but it gave him a spasm that made him dig his heels into the ground and jerk his arms nervously about as he threw off the shock. Always afterward he looked for snakes among his flowers ... There were many snakes along the river, and botany became a hazardous pursuit."

Once the position of the confluence had been determined, Frémont proceeded to make a survey of the river from there to its mouth. He meticulously recorded distances between various landmarks, which suggests to me that the entirety of this survey was made via canoe. However, he did not record the date of departure from the Raccoon Fork, nor any other dates during this descent. The sole surviving herbarium specimen from the period was collected on Saturday, 17 July, at the Red Rocks in what is today Marion Co. (cf. Anonymous, 1881; Lees, 1914; Rogers, 1993). I assume that it was rather late in this descent of the river that Geyer's botanical collections "suffered much by the filling of a canoe" (Geyer, 1845: 480), based on the small number of surviving specimens. [If the accident and loss had occurred earlier, the industrious botanist would have had time to replace the material lost with fresh collections.]

Once the group passed Portland (Leando), they were on the portion of the river that they had bypassed during the overland portion of their ascent: the Great Bend of the river in Van Buren Co., with its rapids and the mouth of Indian Creek; Sweet Home and St. Francisville in Clark Co., Missouri; and the mouth of Sugar Creek in Lee Co., Iowa. They arrived back in Churchville, Missouri, no later than Tuesday, 20 July, having covered the 160 miles from the Red Rocks in just three days. Most of the hired hands had disembarked when they reached Phelps's trading post. The one Chouteau engagé who did not was Packesayso. At Churchville on Wednesday, 21 July, he received an additional $15.75 for service as a boatman through 24 July. [A reasonable interpretation of this anachronism is that he was paid to return the borrowed canoe to Phelps.]

The steamboat *Monsoon* had experienced a fire and grounding during her return to St. Louis on 28 June (Hughes, 1841). However, the damage was soon repaired and she was back in service by the time Frémont and party returned from the Raccoon Fork. Her advertised schedule (Anonymous, 1841) called for her to depart Warsaw, Illinois, at 8:00 PM on Tuesday, 20 July, and Quincy, Illinois, at 8:00 AM on Wednesday, 21 July. [Based on Packesayso's pay voucher (see above), I infer that the party embarked at Churchville very early Wednesday. Frémont's voucher for the steamboat fare was dated at St. Louis on Thursday, 22 July.]

Back in St. Louis, Frémont found a letter waiting for him from Nicollet, a reply to his of 23 June. Dated 11 July, it reported that "everyone here ... asks for you, even at Mr. B[enton]'s, each time I go there. The young ladies [i.e., Jessie and her sisters] arrived the

day before yesterday [from a family wedding in Virginia] . . . Everything is fine, you are happily and impatiently awaited" (Jackson & Spence, 1970: 97). In response to Frémont's concern for Geyer's financial situation, Nicollet wrote that he had arranged for Chouteau to pay Geyer an additional $100 on Nicollet's personal account.

Using funds deposited earlier in the Bank of St. Louis, Frémont settled his account with Chouteau & Co. The various company-supplied provisions consumed and the hire of the four engagés totaled $236.35. In light of his payment to L. B. Mitchell (see above), it is not clear why Chouteau & Co. billed him $10 for transportation from the mouth of the Des Moines to the Sauk and Meskwaki village, or $23 for 18 days use of a mule and wagon. Frémont also settled accounts with Lambert and Geyer, paying them $60.50 and $46.50 for their services, respectively.

The specimens that Geyer had gathered were entrusted for identification to George Engelmann (see above). It was perhaps with an eye toward ameliorating his impecuniosity that Geyer spent the following year collecting 20 duplicate sets of 150 specimens each at St. Louis and Beardstown, Illinois, which were described by Engelmann (1843) and offered for sale at $6 per set by Gray (1843).

Frémont was back in Washington no later than 12 August. If indeed the young lieutenant had been sent away to cool Jessie Benton's ardor for him, it was to no avail. On 19 October, while Sen. Benton was out of the city, the couple was wed secretly at the home of former Attorney General John Jordan Crittenden (1787–1863) by Father Joseph Van Horseigh of St. Peter's Roman Catholic Church (Frémont, 1887; Phillips, 1935).

Frémont's final report to Col. Abert, prepared in Jessie's handwriting, was dated 19 April 1842. He then was absent from Washington on his first expedition to the Rocky Mountains from 2 May to 29 October (Frémont, 1843; Welsh, 1998). On 10 December, he replied to the query about the Des Moines River survey from Rep. Edwards (see above), and that reply and his report (along with Capt. Guion's report; see above) were published by the United States House of Representatives on 31 December 1842. Despite Sen. Benton's supposed interest in the expedition and its bearing on the Iowa–Missouri border (see above), there was no Senate version of the report (cf. Nicollet, 1843b, 1845; Torrey, 1843, 1845).

Descriptions of Vegetation

In closing his report to Col. Abert, Frémont wrote that the "botany and geology of the region visited occupied a considerable share of my attention. Should it be required by the bureau, these may form the subject of a separate report" (Frémont, 1842: 18). The Bureau of the Corps of Topographical Engineers apparently saw no need for such a report, as none has been found in its archives (Jackson & Spence, 1970).

However, the report that was submitted and published did contain narrative descriptions of the vegetation in various areas. The plant communities Frémont described constituted both prairie and forest, with upland and bottomland representations of each (cf. Roosa et al., 1989; Eilers & Roosa, 1994; Yatskievych, 1999). Earlier works on Iowa (e.g., Plumbe, 1839; Galland, 1840) had contained descriptions of this sort, but Frémont's report differed in the use of binomials instead of vernacular names. For example, compare Galland's (1840: 8) simple reference to Iowa possessing "all the varieties of oak" with Frémont's (1842) careful notes on the ecological and geographical distribution of the various species of *Quercus* L. It is this commitment to the formalities of botany and the participation of a professional botanist (Geyer) that make Frémont's report the first scientific publication devoted to the Iowa flora.

Unfortunately, many of the binomials were garbled badly in print. According to Jackson and Spence (1970), this was not true with the original handwritten report. From this I infer that the errors originated with a typesetter unschooled in botany, and that Frémont did not have the opportunity to review page proofs. In the present section, I have corrected these misspellings; the original garbled version will be found in the next section, where the individual species and their authors are listed.

Upland Forest

In Clark Co., Missouri, the southeastern end of the ridge between the Des Moines and Fox rivers was dominated by blackjack oak (*Quercus marilandica*) and shingle oak (*Q. imbricaria*). The predominance of these species suggests a relatively dry open forest (or perhaps even savannah) on this ridge. Farther upriver at Phelps's trading post, the bluffs along the river were dominated by white oak (*Q. alba*), mixed with bur oak (*Q. macrocarpa*), black oak (*Q. velutina*), and shagbark hickory (*Carya ovata*). These are the typical species in most of Iowa's forest on dry to mesic uplands.

Between the Cedar Creek prairie (see below) and the Raccoon Fork, "the whole region [was] densely and luxuriantly timbered . . . covered with heavy and dense bodies of timber, with a luxuriant soil and almost impenetrable undergrowth. . . . The heaviest bodies lie on the Three Rivers [in what is today

northeastern Warren Co.], where it extends out to the top of the main ridge, about thirty miles. On the northern side of the Des Moines, the ridge appeared to be continuously wooded" (Frémont 1842: 17). Both bluffs and level uplands in this region were dominated by sugar maple (*Acer saccharum* Marshall), black walnut (*Juglans nigra*), butternut (*J. cinerea*), and hackberry (*Celtis occidentalis*), indicating an even more mesic setting.

BOTTOMLAND FOREST

Forests on floodplains and lower terraces differed considerably in their composition. Around Phelps's trading post, they comprised basswood (*Tilia americana*), American elm (*Ulmus americana*), slippery elm (*U. rubra*), river birch (*Betula nigra*), pecan (*Carya illinoinensis*), hop-hornbeam (*Ostrya virginiana*), Kentucky coffee-tree (*Gymnocladus dioicus*), and hackberry (*Celtis occidentalis*). In areas increasingly prone to inundation, silver maple (*Acer saccharinum* L.), cottonwood (*Populus deltoides*), and groves of sandbar willow (*Salix interior*) dominated.

BOTTOMLAND PRAIRIE

Along the lower course of the river, the floodplains and terraces often were not forested. The floodplain of the Mississippi between the Des Moines and Fox rivers in Clark Co., Missouri, was "a luxuriant prairie bottom . . . covered with a profusion of flowers, among which the characteristic plant was *Psoralea onobrychis*" (Frémont, 1842: 16). On the left bank of the Des Moines River in Van Buren Co., Iowa, a few miles above Leando where the floodplain averages one-quarter to one-half mile in width (Lees, 1914), Frémont noted "quantities of *Liatris resinosa* [Nutt.], mingled with *Rudbeckia digitata* [Mill.]" (Frémont, 1842: 16); such species are likewise characteristic of bottomland prairie. He also mentioned an unspecified location where "prairie bottoms bordering the river were filled with *Liatris pycnostachya* [Michx.]" (Frémont, 1842: 16).

UPLAND PRAIRIE

The highest ridges and the broad level areas between streams were also clad in prairie. The dry open oak forest on the ridge between the Des Moines and Fox rivers (see above) gave way after two miles to "a narrow level prairie . . . from one and a half miles to three miles in width, limited by the timber which generally commences with the descent of the river hills" (Frémont, 1842: 16). Here, the *Psoralea onobrychis* that had been so common in the bottomland prairie "gave place . . . to a species of *Cacalia* [L.], which was followed, on its disappearance further up, by *Parthenium integrifolium*" (Frémont, 1842: 16). This prairie extended from west of St. Francisville, Missouri, to within 2 1/2 miles of Chequest Creek in Van Buren Co., Iowa. Frémont also mentioned a narrow prairie between Chequest Creek and Soap Creek. The latter stream enters the Des Moines from the west upstream from Iowaville, so that this prairie would have begun in northwestern Van Buren Co. and extended westward into what is today Davis Co., Iowa.

The most expansive prairie seen by Frémont lay in what is today Mahaska, Marion, and Monroe counties, Iowa. This prairie began at the mouth of Cedar Creek, a tributary that enters the Des Moines from the west in southwestern Mahaska Co. It covered all the uplands from there south and west to the ridge marking the watershed of the Chariton River, a tributary of the Missouri River. It was described as having "a rich soil, covered with the usual innumerable flowers and copses of hazel and wild plum" (Frémont: 1842: 17).

List of Species

The specimens that Geyer collected and gave to George Engelmann (see above) today reside with the remainder of Engelmann's collections in the herbarium (MO) of the Missouri Botanical Garden (Wolf, 1988). Seven specimens from the 1841 Frémont–Geyer expedition appear on that institution's Tropicos® database (<http://www.tropicos.org/>). Curiously, none of them represent species mentioned in print; the two sets of names are mutually exclusive.

I visited MO in March 2013 seeking vouchers for species mentioned in the report, but found not one. I also searched the herbarium for any 1841 Geyer specimens of species that might be expected to bloom in early summer in the Des Moines River valley, but likewise with no success. It indeed appears that most of Geyer's specimens collected in Iowa were destroyed in the canoe accident on the river (Geyer, 1845). Geyer (1845) believed that the survivors included new taxa, but I am unaware of any name, effectively published or otherwise, that was based on these specimens (Lammers, 1985; Wolf, 1988).

In this section, these seven documented species are intercalated with the 30 species mentioned in the report. They are arranged alphabetically rather than by family, to facilitate intercalation with Welsh's (1998) list of species from Frémont's subsequent expeditions. For each specimen, label data are quoted verbatim (portions in brackets are editorial additions) and its page on Tropicos® cited. For each

literature report, information presented in quotation marks is verbatim (Frémont, 1842: 16–17); the remainder is my editorial interpretation. Information on the geographic distribution of species in the region derives from Roosa et al. (1989), Eilers and Roosa (1994), and Yatskievych (1999, 2006, 2013) unless otherwise indicated.

As noted in the preceding section, the names used by Frémont (1842) were often garbled by the typesetter. Aside from these orthographic errors, the names employed in several cases still differ from those used to denote the same entities today. See Lammers (2013) for an extended discussion of how I have dealt with this problem of synonymy in early literature.

Acer saccharinum L. (Sapindaceae) – "Acer eridcarfurm" was observed along the Des Moines River from the Raccoon Fork to its mouth, "on the banks of such rivers as have a gravelly bed . . . seen almost constantly along the shore." *Acer eriocarpum* Michx. is a heterotypic synonym of *A. saccharinum* (Torrey & Gray, 1840), which is common throughout Iowa.

Acer saccharum Marsh. (Sapindaceae) – "Acer saccharium" was observed along the Des Moines River below Raccoon Fork, in what is today Polk or Warren Co., Iowa, in "heavy and dense bodies of timber . . . on the broken slopes of the bluffs as on the uplands." In this part of Iowa, trees of *A. saccharum* subsp. *nigrum* (Michx. f.) Desmarais tend to be more common than those of the autonymic subspecies, though both occur.

Actaea rubra (Aiton) Willd. (Ranunculaceae) – IOWA. [**Marion Co.:**] shady rocky woods of the upper Des Moines at the mouth of English River [i.e., English Creek], 7 July 1841, *C. A. Geyer s.n.* (MO) [<http://www.tropicos.org/Specimen/2605002>]. The specimen was identified by J. M. Kane in 1966. This forest herb is rare in southeastern and south-central Iowa though common elsewhere in the state.

Arnoglossum plantagineum Raf. (Asteraceae) – "A species of causalia" [*Cacalia* L., nom. rej.] was seen to be "very abundant" west and northwest of St. Francisville in Clark Co., Missouri, on the southerly portion of the "narrow level prairie, occupying the summit of the ridge between the Fox and Des Moines rivers." Midwestern species formerly placed in *Cacalia* now are assigned to either *Arnoglossum* Raf. or *Hasteola* Raf. Of the species known from northeastern Missouri, only *A. plantagineum* would be found on upland prairie (Yatskievych, 2006).

Betula nigra L. (Betulaceae) – "Betula rubra" was observed on the left bank of the Des Moines River, "at the post of Mr. Phelps . . . on the bottom land of the creeks" in what is today Ottumwa in Wapello Co., Iowa. *Betula rubra* Michx. f. is a heterotypic synonym of *B. nigra* (Furlow, 1997), which is common in eastern Iowa but less so toward the southwestern counties.

Calamagrostis canadensis (Michx.) P. Beauv. (Poaceae) – IOWA. [**Warren Co.:**] near the mouth of the two rivers on the upper Des Moines River [i.e., Middle River and South River, northeast of Hartford], in poplar thickets on a sandbar, 9 July 1841, *C. A. Geyer s.n.* (MO) [<http://www.tropicos.org/Specimen/2501424>]. This wetland grass is frequent to common throughout much of Iowa.

Carya illinoinensis (Wang.) K. Koch (Juglandaceae) – "Carya olivaeformis" was observed on the left bank of the Des Moines River, "at the post of Mr. Phelps . . . on the bottom land of the creeks" in what is today Ottumwa in Wapello Co., Iowa. *Carya oliviformis* (Michx.) Nutt. is a heterotypic synonym of *C. illinoinensis* (Stone, 1997). Pecan trees are very rare in Iowa, known only from the floodplain of the Mississippi River in the southeastern and east-central counties (Lammers & van der Valk, 1977); this is the sole report of them from anywhere else in the state.

Carya ovata (Mill.) K. Koch (Juglandaceae) – "Carya alba" was observed on the left bank of the Des Moines River, "at the post of Mr. Phelps . . . [o]n the bluffs" and "now and then . . . in the bottoms" in what is today Ottumwa in Wapello Co., Iowa. *Carya alba* (L.) Nutt., nom. rej., was applied to both *C. ovata* and *C. tomentosa* (Poir.) Nutt. (Stone, 1997); the former is by far the more common of the two in Iowa.

Ceanothus americanus L. (Rhamnaceae) – "Clanothus" [*Ceanothus* L.] was observed in the "river hills, which were broken, wooded, and filled with [its] delicate fragrance" south of Chequest Creek and four miles above its mouth in Van Buren Co., Iowa. Of the two species of the genus in Iowa, *C. americanus* is by far the more common in the southeastern counties, particularly in forested settings.

Celtis occidentalis L. (Cannabaceae) – "Celtis accidentalis" was "found everywhere" on the left bank of the Des Moines River "at the post of Mr. Phelps" in what is today Ottumwa in Wapello Co., Iowa. *Celtis crassifolia* Lam. was observed on the Des Moines River below the mouth of the Raccoon River in Polk Co. or Warren Co., in "heavy and dense bodies of timber . . . on the broken slopes of the bluffs as on the uplands." This name is a heterotypic synonym of *C. occidentalis* (Fernald, 1950), which is common throughout Iowa.

Clematis pitcheri Torr. & A. Gray (Ranunculaceae) – IOWA. [**Van Buren** or **Davis Co.:**] Banks of Des Moines River near Iowaville, 29 June 1841, *C. A.*

Geyer s.n. (MO) [<http://www.tropicos.org/Specimen/100241782>]. The specimen was identified by R. O. Erickson in 1942. Because *C. pitcheri* had been described only a few years earlier (Torrey & Gray, 1838), this may be one of the specimens that Geyer (1845) thought represented an undescribed species. It is common in southeastern Iowa, but less so elsewhere in the state.

Corylus americana Walt. (Betulaceae) – "Hazel" was observed "on the uplands bordering Cedar river" [i.e., Cedar Creek] in what is today Mahaska Co., Iowa, in "prairie with a rich soil." This shrub is common throughout most of Iowa.

Eragrostis pectinacea (Michx.) Nees (Poaceae) – IOWA. [**Marion Co.:**] on a sandbar of the upper Des Moines near mouth of English River [i.e., English Creek], 7 July 1841, *C. A. Geyer s.n.* (MO) [<http://www.tropicos.org/Specimen/2560310>]. The specimen was identified by L. H. Harvey in 1981. This annual grass is common throughout the state.

Festuca paradoxa Desv. (Poaceae) – IOWA. [**Marion Co.:**] grassy low banks of the upper Des Moines River at the mouth of English River [i.e., English Creek], 7 July 1841, *C. A. Geyer s.n.* (MO) [<http://www.tropicos.org/Specimen/2573714>. The specimen was identified by C. A. Taylor in 1958. Because *F. paradoxa* had been described just 10 years earlier in an obscure European journal (Desvaux, 1831), this may have been one of the specimens thought by Geyer (1845) to represent an undescribed species. It is very rare in Iowa, found at scattered localities in the south-central and east-central counties (Pohl, 1966).

Gymnocladus dioicus (L.) K. Koch (Fabaceae) – "Gymnoeladus canadensis" was observed on the left bank of the Des Moines River, "at the post of Mr. Phelps . . . on the bottom land of the creeks" in what is today Ottumwa in Wapello Co., Iowa. *Gymnocladus canadensis* Lam., nom. illeg, is a homotypic synonym of *G. dioicus* (Yatskievych, 2006), which is frequent to infrequent throughout Iowa.

Juglans cinerea L. (Juglandaceae) – "Inglans cathartica" was reported from the Des Moines River below the mouth of the Raccoon River in Polk Co. or Warren Co., in "heavy and dense bodies of timber . . . on the broken slopes of the bluffs as on the uplands." *Juglans cathartica* Michx. is a heterotypic synonym of *J. cinerea* (Nuttall, 1818), which is common in the eastern half of Iowa, but less so toward the southwestern counties.

Juglans nigra L. (Juglandaceae) – "Inglans nigra" was reported from the Des Moines River below the mouth of the Raccoon River in Polk Co. or Warren Co., in "heavy and dense bodies of timber . . . on the broken slopes of the bluffs as on the uplands." This tree is common throughout Iowa.

Juncus tenuis Willd. (Juncaceae) – IOWA. [**Mahaska Co.:**] on a sandbar of the upper Des Moines, 10 mi. above the upper Saki [Sauk] village, 4 July 1841, *C. A. Geyer s.n.* (MO) [<http://www.tropicos.org/Specimen/100314746>]. After the binomial is written "var" followed by a four-word Latin ablative phrase; perhaps this is one of the specimens that Geyer (1845) thought represented an undescribed taxon. This rush is common throughout most of Iowa.

Liatris aspera Michx. (Asteraceae) – "Lyatris resinosa" was observed "a few miles above Portland [i.e., Leando], on the north bank of the river" in Van Buren Co., Iowa. *Liatris resinosa* Nutt. is a homotypic synonym of *L. spicata* (L.) Willd. var. *resinosa* (Nutt.) Gaiser, a taxon found only in the southern United States (Nesom, 2006). Of the species of this genus occurring in Iowa, *L. aspera* most likely was the plant Frémont saw, as it is frequent to common throughout the state and resembles *L. spicata* in inflorescence structure.

Liatris pycnostachya Michx. (Asteraceae) – "Lyatris pycnostachya" was seen in "prairie bottoms bordering the river" in Van Buren Co., Iowa. This perennial herb is frequent to common throughout most of Iowa.

Ostrya virginiana (Mill.) K. Koch (Betulaceae) – "Osteya Virginica" was seen on the left bank of the Des Moines River, "at the post of Mr. Phelps . . . on the bottom land of the creeks" in what is today Ottumwa in Wapello Co., Iowa. This small hardwood is frequent to common throughout the state.

Parthenium integrifolium L. (Asteraceae) – This species was seen to be "very abundant" west and northwest of St. Francisville in Clark Co., Missouri, on the northerly portion of the "narrow level prairie, occupying the summit of the ridge between the Fox and Des Moines rivers." This perennial herb is found throughout most of Missouri (Yatskievych, 2006).

Polygala senega L. (Polygalaceae) – IOWA. [**Marion Co.:**] on the top of the Red bluffs, Upper Des Moines River, 17 July 1841, *C. A. Geyer s.n.* (MO) [<http://www.tropicos.org/Specimen/1055872>]. The specimen was identified by S. K. Chen in 1988 and A. E. Trauth in 1997. This perennial herb is rare in central and southeastern Iowa, becoming more frequent toward the northeastern counties.

Populus deltoides Bartram ex Marsh. (Salicaceae) – *Populus canadensis* Moench was reported from the left bank of the Des Moines River, "at the post of Mr. Phelps . . . form[ing] groves in the inundated river bottoms" in what is today Ottumwa in Wapello Co., Iowa. This binomial has been misapplied to *P.*

deltoides, a common tree throughout Iowa; the name was actually based upon a hybrid between North American *P. deltoides* and Eurasian *P. nigra*, which occurred in cultivation in Europe (Argus et al., 2010).

Prunus americana Marsh. (Rosaceae) – "Wild plum" was observed "on the uplands bordering Cedar river [i.e., Cedar Creek]" in what is today Mahaska Co., Iowa, in "prairie with a rich soil." This is the common native plum throughout Iowa.

Psoralea onobrychis Nutt. (Fabaceae) – Frémont declared that "psoralia onolaychis" was a "characteristic plant" of the "luxuriant prairie bottom, bordered by the timber of the Fox and Des Moines rivers" on the Mississippi River floodplain "near the mouth of the Des Moines" in Clark Co., Missouri. This perennial legume is rare in Missouri, known only from the northeastern corner south to Franklin and Osage counties; in Iowa, it is found only in the extreme southeastern counties (Roosa et al., 1989; Isely, 1998).

Quercus alba L. (Fagaceae) – White oak was observed on the left bank of the Des Moines River, "at the post of Mr. Phelps" in what is today Ottumwa in Wapello Co., Iowa, "[o]n the bluffs" and "now and then ... in the bottoms." It is very common throughout Iowa.

Quercus imbricaria Michx. (Fagaceae) – Shingle oak was observed on the bluffs overlooking the Mississippi River floodplain south of St. Francisville in Clark Co., Missouri, between the Des Moines and Fox rivers. It is common throughout most of Missouri (Yatskievych, 2013).

Quercus macrocarpa Michx. (Fagaceae) – "Quercus malrocarpa" was observed on the left bank of the Des Moines River, "at the post of Mr. Phelps" in what is today Ottumwa in Wapello Co., Iowa, "[o]n the bluffs" and "now and then ... in the bottoms." Bur oak is frequent to common throughout Iowa.

Quercus marilandica Muenchh. (Fagaceae) – *Quercus nigra* L. was reported from the bluffs overlooking the Mississippi River floodplain south of St. Francisville, between the Des Moines and Fox rivers in Clark Co., Missouri. However, that species that does not ascend the Mississippi River farther than southeastern Missouri and inhabits wet woodlands not bluffs (Nixon, 1997). Of the oaks found in northeastern portion of the state (Yatskievych, 2013), *Q. marilandica* most likely was the one seen.

Quercus velutina Lam. (Fagaceae) – "Quercus tuictoria" was reported from the left bank of the Des Moines River, "at the post of Mr. Phelps" in what is today Ottumwa in Wapello Co., Iowa, "[o]n the bluffs" and "now and then ... in the bottoms." *Quercus tinctoria* W. Bartram is a heterotypic synonym of *Q. velutina* (Nixon, 1997), which is frequent to common throughout much of the state.

Rudbeckia laciniata L. (Asteraceae) – "Rudbackia digetata" was reported from "a few miles above Portland [i.e., Leando], on the north bank of the river" in Van Buren Co., Iowa. *Rudbeckia digitata* Mill. is a heterotypic synonym of *R. laciniata* var. *humilis* A. Gray, a taxon known only from the southeastern United States (Urbatsch & Cox, 2006). Iowa populations of *R. laciniata* belong to the autonymic variety.

Salix interior Rowlee (Salicaceae) – "Salex" [*Salix* L.] was observed on the left bank of the Des Moines River, "at the post of Mr. Phelps" in what is today Ottumwa in Wapello Co., Iowa, "form[ing] groves in the inundated river bottoms." Of the several species of willow in Iowa, *S. interior*, which is common throughout, is most likely to form groves in the indicated habitat.

Sambucus canadensis L. (Caprifoliaceae) – "Elder ... fragrant and white" was reported from the left bank of the Des Moines River above Portland [i.e., Leando] in Van Buren Co., Iowa. It is common throughout Iowa.

Tilia americana L. (Tiliaceae) – *Tilia* L. was observed on the left bank of the Des Moines River, "at the post of Mr. Phelps" in what is today Ottumwa in Wapello Co., Iowa, "in the bottoms." *Tilia americana* is the only native species of the genus in Iowa and it is common throughout.

Ulmus americana L. (Ulmaceae) – "Ulmes Americana" was observed on the left bank of the Des Moines River, "at the post of Mr. Phelps" in what is today Ottumwa in Wapello Co., Iowa, "on the bottom land of the creeks." This tree was common throughout Iowa prior to 1928, when pathogenic fungi of the genus *Ophiostoma* Syd. & P. Syd. (Ascomycota) were introduced to North America.

Ulmus rubra Muhl. (Ulmaceae) – "Ulmes fulvia" was observed on the left bank of the Des Moines River, "at the post of Mr. Phelps" in what is today Ottumwa in Wapello Co., Iowa, "on the bottom land of the creeks." *Ulmus fulva* Michx. is a heterotypic synonym of *U. rubra* (Sherman-Broyles et al., 1997), which is frequent to common throughout much of Iowa.

Summary

The 1841 Frémont–Geyer expedition to the Des Moines River left to posterity information on 37 species of flowering plants. Seven herbaceous species are documented by Geyer's specimens at MO; one of these, *Festuca paradoxa*, today is rather rare in Iowa. The remaining 30 are unvouchered literature reports

(Frémont, 1842), representing 24 trees and shrubs of the forest and six herbs of the prairie. Of these, *Psoralea onobrychis* is rather rare in the region, while *Carya illinoinensis* never has been documented from the Des Moines River valley, only the Mississippi. Three (*Liatris spicata* var. *resinosa*, *Quercus nigra*, and *Rudbeckia laciniata* var. *humilis*) do not occur anywhere near the region and a more likely identity has been suggested for each.

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